

CLAIMS

1. A multilevel speed regulation jack comprising:
 - an input oil cylinder;
 - an output oil cylinder comprising a cylinder body containing an annular space and a tube piston that fits in said annular space, said tube piston comprising a sliding sleeve movably positioned in said annular space;
 - a fluid conduit member connecting the input and output oil cylinders;
 - an annular in-flow oil chamber formed between an end annular surface of the tube piston and the cylinder body; and
 - a central in-flow oil chamber formed between an inner central surface of the tube piston and the cylinder body,
 - wherein the fluid conduit member comprises at least two parallel fluid channels connected to the central in-flow oil chamber and the annular in-flow oil chamber, respectively; and
 - a control valve in one of the fluid channels to open and close the channel.
2. The multilevel speed regulation jack of claim 1, wherein said cylinder body has two or more annular spaces and two or more tube pistons movably positioned in their respective annular space to form two or more annular in-flow oil chambers.
3. The multilevel speed regulation jack of claim 2, wherein:
 - each of said annular in-flow oil chambers is connected to an input oil cylinder through a parallel fluid channel; and
 - each of said fluid channels has a control valve, which is sequence-programmed and threshold-preset and close and open the fluid channels based on the load signals they sense.
4. The multilevel speed regulation jack of claim 1, wherein:
 - said annular in-flow oil chamber is singular;
 - said control valve is in the fluid channel connected to the central in-flow oil chamber or to the annular in-flow oil chamber; and

said jack further comprises at least one input oil cylinder, which is unidirectionally connected to the annular or central in-flow oil chamber via a fluid conduit, wherein said fluid conduit has a control valve, which is connected to an oil reservoir.

5. The multilevel speed regulation jack of claim 1, wherein:
said annular in-flow oil chamber is singular;
said control valve is in the fluid channel connected to the central in-flow oil chamber or the fluid channel connected to the annular in-flow oil chamber;
the two fluid channels share a common oil path near the input oil cylinder;
the common oil path has a control valve, which controls the open/close state of the path;
and
said jack further comprises at least one fluid channel, which is parallel to said two fluid channels and is connected to the annular or central in-flow chamber, wherein a speed-shifting cylinder member lies in said parallel channel.

6. The multilevel speed regulation jack of claim 5, wherein:
said speed-shifting cylinder member has a spring-reset device;
the out-flow oil chamber of said speed-shifting cylinder member is connected to an oil reservoir via a check valve;
the speed-shifting cylinder member comprises two oil cylinders, wherein the thrust surface of piston in the primary oil cylinder is smaller than that in the secondary oil cylinder;
the primary and the secondary pistons are linked through piston rods; and
said speed-shifting oil cylinder member further comprises a single oil cylinder, wherein the piston rod protrudes out from the in-flow oil chamber.

7. The multilevel speed regulation jack of claim 1, wherein:
said control valve in the fluid channel connected to the annular in-flow oil chamber or central in-flow chamber is a sequence valve or check valve; and
the opening of said check valve is towards the annular in-flow oil chamber or central in-flow oil chamber.

8. The multilevel speed regulation jack of claim 1, wherein said annular in-flow oil chamber and said central in-flow oil chamber in the output oil cylinder are connected to an oil reservoir via a discharge valve.

9. The multilevel speed regulation jack of claim 1, wherein said annular in-flow oil chamber or said central in-flow oil chamber in the output oil cylinder are not set to be the first in-flow working chamber and are connected to a fluid suction channel.

10. The multilevel speed regulation jack of claim 1, wherein:
said input cylinder and said fluid conduit member are configured into a valve assembly;
said output cylinder is housed in an oil reservoir to form an assembled unit; and
said assembled unit and said valve assembly are hermetically coupled.